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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/177,814 10/23/98 GILTON

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EXAMINER

HM22/0103

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GABEL, G

ART UNIT

PAPER NUMBER

1641

DATE MAILED:

01/03/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/177,814

Applicant(s)

Gilton

Examiner

Gallene R. Gab I

Group Art Unit

1641

☒ Responsive to communication(s) filed on Oct 18, 1999

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 1, 3-64, 66-74, and 105-107 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1, 3-64, 66-74, and 105-107 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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DETAILED ACTION

Amendment Entry

1. Applicant's amendment and response filed October 18, 1999 is acknowledged and has been entered. Claims 2, 65, 75-104, and 108-110 have been canceled by applicant without prejudice. Claims 1, 3-12, 16-22, 29-31, 39-43, 45-46, 50-52, 56-58, 64, 72, and 105 have been amended. Claims 1, 3-64, 66-74, and 105-107 are pending and under examination.

Claim Rejections - 35 USC § 112

2. Examiner acknowledges the oversight on the rejection of claim 42 which was correctly identified by applicant as applying instead to claim 46. Furthermore, examiner acknowledges that the rejection to claim 1 was not identified. Alternatively, applicant has duly corrected indefiniteness to the claim for use of the term "including" and replaced therfor, the term -- comprising--.

In view of the rewritten and canceled claims, the rejection under 35 USC § 112 second paragraph is hereby withdrawn.

New Matter

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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3. Claims 1, 4, 5, 16, 17, 57, 64, and 72, as amended, are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In this case, applicant amended the claims aforementioned in paragraph 3 to remove silicon (substrate) and incorporate therein, semiconductor (substrate). However, the specification fails to provide functional or literal support for the recitation of a "semiconductor substrate". Page 11, lines 4-7 discloses a substrate as being formed of material such as silicon, gallium arsenide, and indium phosphide ... upon which electrical devices such as detectors can be formed. However, the specification does not appear to provide literal support for such recitation and none of the originally filed claims recited the limitation in question. Recitation of claim limitation lacking literal support in the specification or originally filed claims constitutes new matter.

Claim Rejections - 35 USC § 103

4. Rejection of claims 2 and 65 under 35 USC § 103 is now moot in light of the cancellation of the claims.

5. Claims 1, 3-4, 12-25, 29, 30-34, 38-44, 50-64, 73-74, and 105-107 are rejected under 35 U.S.C. 103(a) as being unpatentable over (1) Miura et al. (US 5,132,012) in view of (2) Wang et al. (US 5,663,488), and in further view of (3) Northrup et al. (US 5,882,496) and Turner et al. (US 5,885,869) for reason of record.

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6. Claims 1, 4, 5, 16, 17, 57, 64, and 72, as amended, are rejected under 35 U.S.C. 103(a) as being unpatentable over (1) Miura et al. (US 5,132,012) in view of (2) Wang et al. (US 5,663,488), and in further view of (3) Northrup et al. (US 5,882,496) and Turner et al. (US 5,885,869) for reason as follows. Specifically, applicant amended the claims aforementioned in paragraph 3 to remove silicon (substrate) and incorporate therein, use of a semiconductor substrate.

Miura et al., Wang et al., and Northrup et al. have been discussed in detail in Paper No. 3. Miura et al., Wang et al., and Northrup et al. fail to teach the silicon substrate as a semiconductor substrate such as recited in the amended claims.

Turner et al. disclose a semiconductor substrate having a silicon dioxide layer formed superadjacent a polysilicon layer wherein a doped rough silicon layer is formed in situ superadjacent the silicon dioxide layer (see column 2, lines 46-53). Turner et al. specifically teach that a semiconductor substrate can be formed of silicon such as taught in the instant invention and as recited in the amended claims. One of ordinary skill in the art at the time of the invention would have reasonable expectation of success in incorporating a semiconductor substrate formed of silicon as taught by Turner et al. into the combined teachings of Miura et al., Wang et al., and Northrup et al. because Turner et al. specifically teach uniformly doping HSG polysilicon in a semiconductor substrate formed of silicon dioxide for use in miniaturized applications for its advantage in increasing surface area.

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7. Claims 1, 3-12, 14-17, 25-38, 42-52, 54-64, ⁶⁶⁻⁷⁴66-69, 71-74 and 105-107 are rejected under 35 U.S.C. 103(a) as being unpatentable over (1) Miura et al. (US 5,132,012) in view of (2) Swedberg et al. (US 5,571,410) and Sunzeri (US 5,536,382) and in further view of (3) Northrup et al. (US 5,882,496) and Turner et al. (US 5,885,869) for reason of record.

Response to Arguments

8. A) Applicant's arguments addressing the rejection to claims 1-4, 12-25, 30-34, 38-44, 50-65, 73-74, and 105-107 under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (from here on, Miura), Wang et al. (from here on, Wang), Northrup et al. (from here on, Northrup), and Turner et al. (from here on, Turner). To reiterate, rejection of claims 2 and 65 under 35 USC § 103(a) is now moot in light of the cancellation of the claims.

Applicant argues that the combination of references fails to teach or suggest the presently claimed invention, the Office has not established a prima facie case of obviousness to combine the references cited, and the references cited "would likely discourage the art worker" from attempting the substitution suggested by the applicant. Additionally, applicant argues that it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teaching of the prior art so that the claim is rendered obvious and that one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. Applicant further disagrees with Examiner's "individual" assessment of Miura, Wang, Northrup, and Turner.

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In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Furthermore, responsive to applicant's allegation that all the cited references teach away from what is taught in the instant invention, it has been held that prior art references must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Miura discloses a miniaturized sample "separator" in the form of a liquid chromatograph comprising an analyzing chip in which the capillary flowpath is formed in a substrate and a field effect transistor detector is disposed downstream of the capillary. Contrary to applicant's contention, Miura does teach a separation matrix wherein the column for separation and the field effect transistor are formed

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integrally with the substrate (see column 4, lines 33-36 and column 17, lines 26-30). Wang is incorporated therein for his teaching of a migration facilitator integrated into a separation column and thermal device for use in selective control of thermal isolation of the thermal zone as well as effecting selective amount of gas pressure in an enclosed cavity. Wang discloses that the migration facilitator changes the gas pressure in the cavity thereby changing the amount of heat transfer between the separation column and housing. Also contrary to applicant's contention, Northrup discloses porous silicon matrices to increase surface area in separation channels, i.e. miniaturized electrophoresis devices and biological/chemical separators (filters) for activated flow devices (see column 1, lines 53-55 and column 2, lines 11-23). Northrup teaches that because of its high surface area and specific pore size, porous silicon can be utilized for a variety of applications on a miniature scale for significantly augmenting adsorption, vaporization, desorption, condensation, and flow of liquids and gasses while maintaining the capability of modification such as being doped or coated using conventional integrated circuit and micromachining. Turner is incorporated therein, for his disclosure in uniformly doping hemispherical grain polycrystalline (HSG) silicon and for his specific teaching of the advantage of using roughened silicon such as HSG silicon in increasing surface area in miniature components. The Office has established a prima facie case of obviousness to combine all the references aforementioned by recognizing that a skilled artisan would have been motivated to substitute porous silicon matrix as taught by Northrup or hemispherical grain silicon (roughened "porous" silicon) as taught by Turner into the separation column of Miura because Miura

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specifically indicated difficulty in miniaturization of liquid column chromatograph and Northrup and Turner specifically teach an advantage in the use of porous silicon or HSG in significantly increasing surface area in a variety of applications and components in the miniature scale, i.e. miniaturized column chromatograph. Furthermore, it would have been obvious to one of ordinary skill in the art at time of the invention to include a migration facilitator as taught by Wang because of his specific teaching that his pump assembly can be used in analytical instruments such as liquid or gas chromatographic systems capable of regulated flow. Responsive to the arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

B) Applicant's arguments addressing the rejection to claims 1-12, 14-17, 25-38, 42-52, 54-69, 71-74, and 105-107 under 35 U.S.C. 103(a) as being unpatentable over Miura, Swedberg et al. (from here on, Swedberg), Sunzeri, Northrup, and Turner. To reiterate, rejection

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of claims 2 and 65 under 35 USC § 103(a) is now moot in light of the cancellation of the claims.

Applicant argues that a prima facie case of obviousness cannot be established where the teachings of the references teach away from the invention as claimed or where no suggestion or incentive to combine the references can be shown or where the references are drawn to entirely different inventions or problems. Specifically, applicant disagrees with the combination of Miura, Northrup, and Turner references in addition to Swedberg and Sunzeri references.

Applicant further disagrees in the Examiner's **individual** assessment of both Swedberg and Sunzeri in addition to Miura, Wang, Northrup, and Turner because all references lack contemplation toward the present invention which would result in a case of unreasonable hindsight reconstruction of the instant invention.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re*

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Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Furthermore, responsive to applicant's allegation that all the cited references teach away from what is taught in the instant invention, it has been held that prior art references must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Miura does teaches a separation matrix wherein the column for separation and the field effect transistor are formed integrally with the substrate. Wang teaches a migration facilitator integrated into a separation column. Northrup discloses porous silicon matrices to increase surface area in separation channels, i.e. miniaturized electrophoresis devices and biological/chemical separators (filters) for activated flow devices. Turner discloses uniformly doping hemispherical grain polycrystalline (HSG) silicon and teaches the advantage of using roughened silicon such as HSG silicon in increasing surface area in miniature components. In addition to the above references, Swedberg is incorporated therein for his teaching of integrated sample analysis of analytes in a miniaturized planar column device having a stationary phase which includes a biocompatible porous medium of particles capable of separation (filtration) and capture function. Sunzeri is also incorporated therein for his teaching in capillary electrophoretic analysis of constituents in human biological fluids and use of standard control to provide a standard for quantitation. The Office has established a prima facie case of obviousness to combine all the references aforementioned by recognizing that a skilled artisan would have been motivated to modify the

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stationary phase in the chromatographic separation apparatus taught by Miura, with porous silicon as taught by Northrup or HSG silicon as taught by Turner, because Miura specifically indicated difficulty in miniaturization of liquid column chromatograph and Northrup and Turner specifically teach an advantage in the use of porous silicon or HSG in significantly increasing surface area in a variety of applications and components in the miniature scale, i.e. miniaturized column chromatograph. One of ordinary skill in the art would have reasonable expectation of success in modifying the stationary phase as taught by Miura with one that effects biocompatibility into the matrix such as taught by Swedberg and Sunzeri in order to combine both filtration and capture functions because Swedberg et al. specifically suggested application of his teachings in separation devices in miniature scales. Furthermore, it would have been obvious to one of ordinary skill in the art at time of the invention to include a migration facilitator as taught by Wang because of his specific teaching that his pump assembly can be used in analytical instruments such as liquid or gas chromatographic systems capable of regulated flow.

Responsive to the arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only

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knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

9. Applicant's arguments filed 10/18/99 have been fully considered but they are not deemed persuasive.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gailene R. Gabel whose telephone number is (703) 305-0807. The

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examiner can normally be reached on Monday to Thursday from 7:00 AM to 4:30 PM. The examiner can also be reached on alternate Fridays from 7:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Housel, can be reached on (703) 308-4027. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-4242.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

Gailene R. Gabel
Patent Examiner
Art Unit 1641


JAMES C. HOUSEL 12/31/99
SUPERVISORY PATENT EXAMINER